



## ***Future Combat System***



NDIA/ARDEC Firepower Symposium

24 June 1998

L.D. Johnson  
FCS Director



# *Outline*



- FCV Lethality/Survivability
- Development Schedule
- Operational Goals
- Technology Opportunities
- System Integration
- Summary & Conclusions



## System Effectiveness Study



# **FCS Operational Goals**



- Lethality**

Defeat all known & projected Threats  
(3-5 km LOS & 10 km NLOS)

- Survivability**

Defeat direct fire CE & KE munitions and top attack weapons  
without heavy armor (Only medium caliber ballistic protection)

- Mobility**

100 kph CC burst speed (70 kph sustained)

- Fightability**

Reduced crew operation/Situational Awareness

- Deployability**

(1) FCS per AAN Advanced Air Transport

- Sustainability**

50-75% reduction in Class III, V IX over 30 day mission  
(Self sufficient for 48 hours)

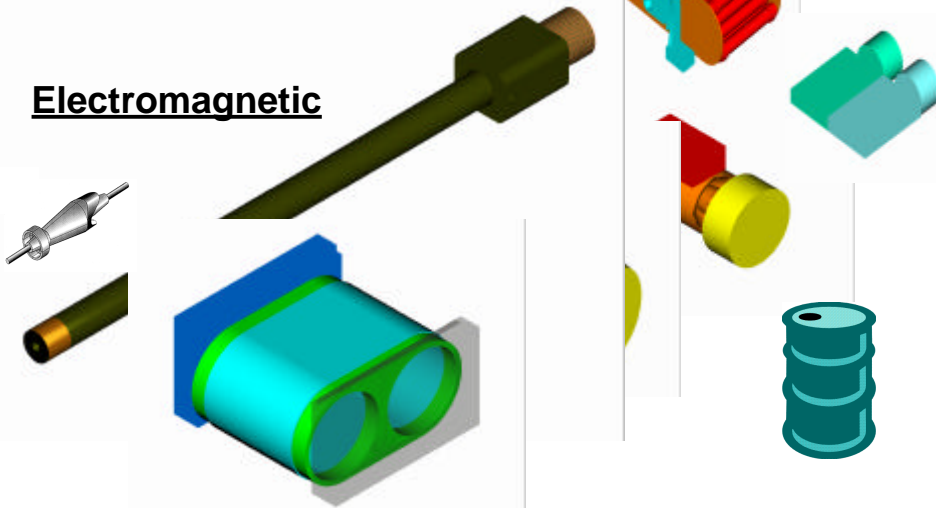
**A multi-role close  
combat system**



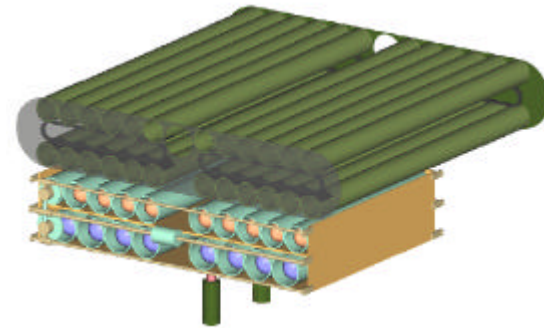
# *lethality - Propulsion*



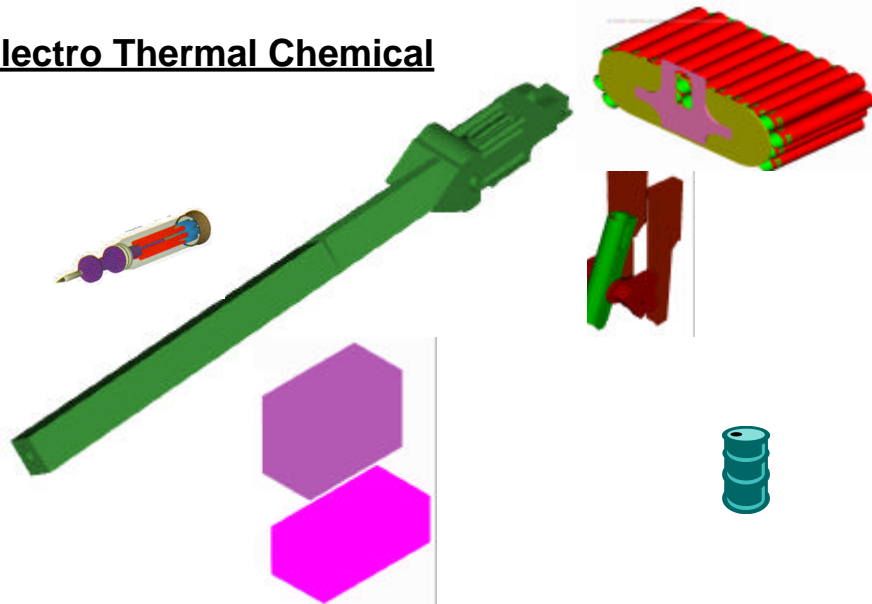
Electromagnetic



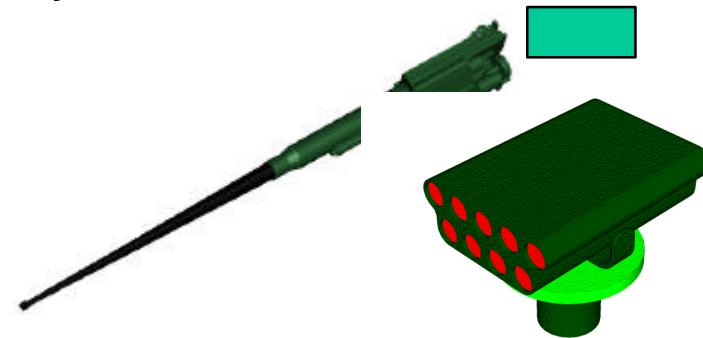
Missile



Electro Thermal Chemical



Hybrid





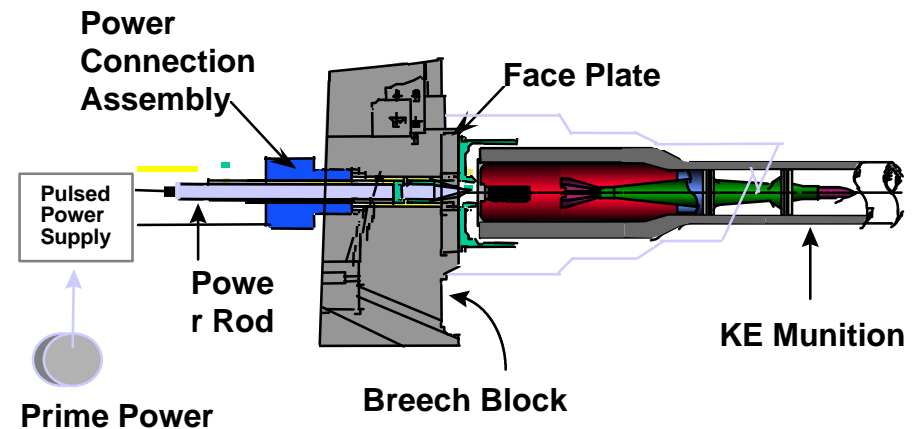
# Electro-Thermal Chemical Gun

## Potential Pay-Off

- 140mm performance with growth potential
- Can fire smart munitions + conventional rounds
- Improved accuracy
- Potential for marginal hypervelocity performance
- Potential for low vulnerability propellant

## Development Issues

- Development of a high energy benign propellant



ETC Power Connection & Breech Configuration

## Assessment

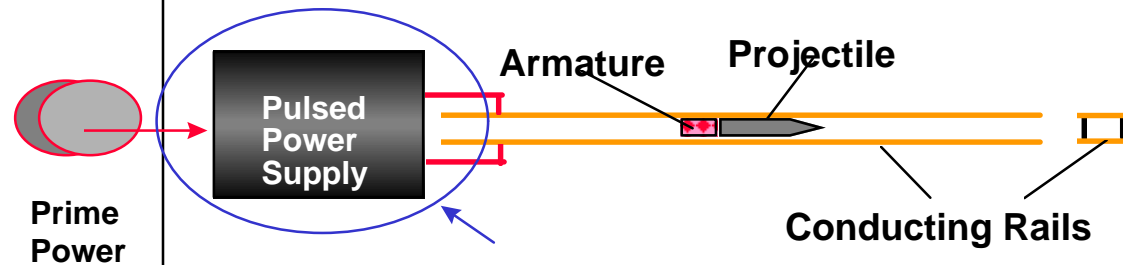
- No revolutionary lethality
- No reduced ammunition logistical burden
- Avoids the burden of a conventional 140mm upgrade
- Most suitable as a risk mitigator to sustain Abrams overmatch



# Electro-Magnetic Gun

## Potential Pay-Off

- Overmatch lethality through both hypervelocity and ordnance velocity; ERA & KE APS defeat
- Tuneable muzzle energy - lethality at ordnance velocity
- Pulsed power available for other applications (DEW)
- Synergy of “all electric” vehicle
- Possible reduction in ammo logistics



## Development Issues

- Pulse power volume/weight
- Utility of hypervelocity against advanced armors
- Launcher and projectile challenges
- High density prime power source (not included in this program)
- Impact on crew and system

## Assessment

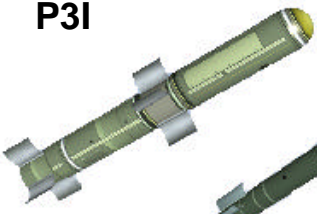

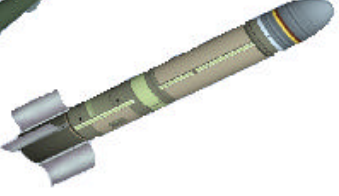
- Potential for revolutionary effects; overmatch with elimination of ammo log tail
- Significant developmental challenges to weaponize
- Pulsed power storage efforts may be most significant contribution



## Missile Technology

### Potential Pay-Off

- Lethality overmatch
  - ◆ LOSAT delivers >15 MJ on target at 4km
- Precision kill > 10km
- Inherent growth potential with minimal changes imposed on system

FOTT P3I	LOSA T P3I	HELLFIR E P3I	
			
30kg	40kg	40kg	Weight
1.25m	2.1m	1.25m	Length
152mm	130mm	175mm	Diameter

### Development Issues

- Reduction in length while maintaining lethality
- Counter measures
- On board survivability
- Fire on the move

### Assessment

- Overwhelming defeat mechanism
- Logistical burden
- Potential mid term bridge if
  - ◆ Reduced in size and weight
  - ◆ Used with another weapon

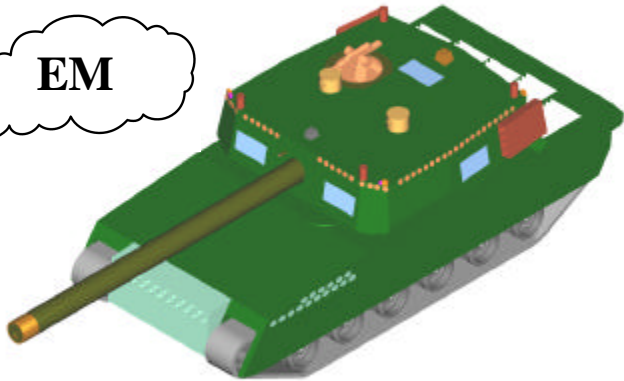




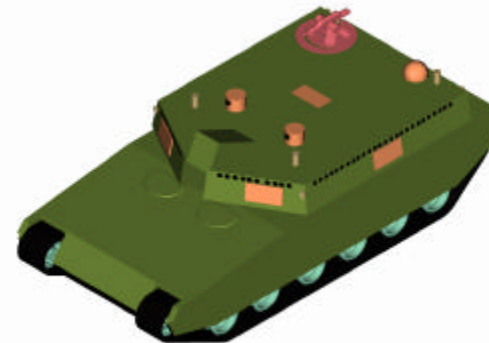
# *Configurations*



EM

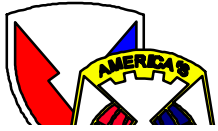


KEM



ETC

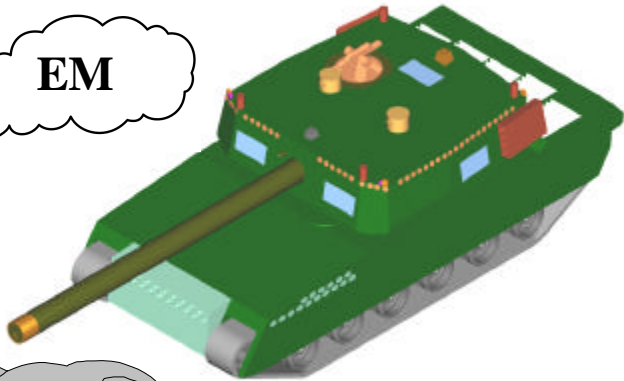




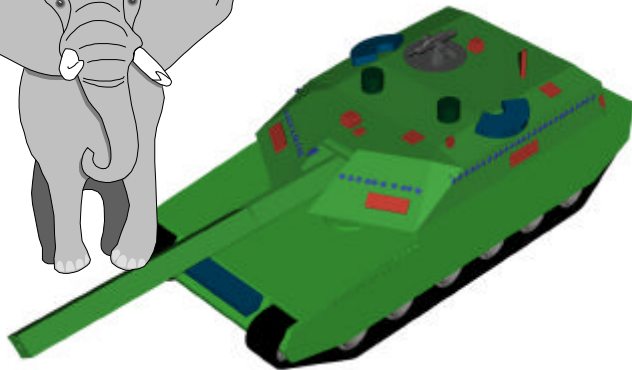
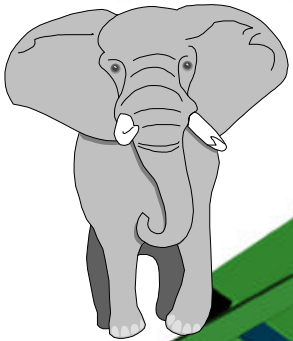
# FCV CONCEPTS



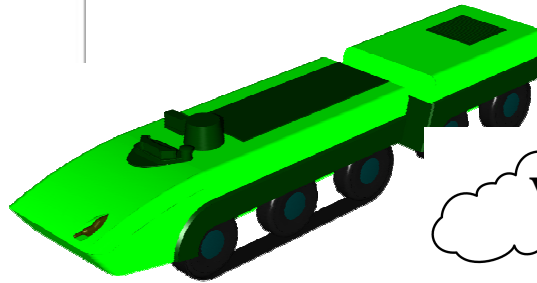
EM



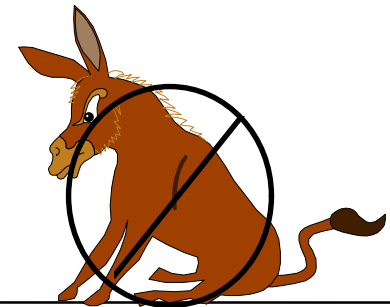
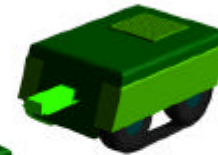
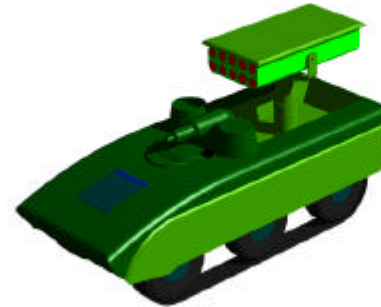
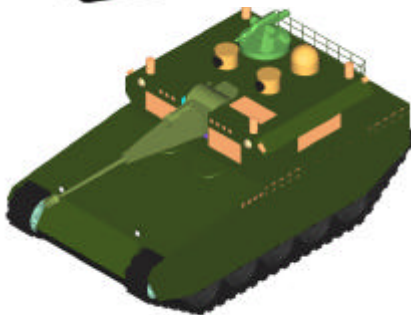
KEM



Viper



E'





## **SUMMARY**

**ONE KILL PER SHOT AT EXTENDED RANGE  
REQUIRES SMART MUNITIONS  
AND OVERWHELMING LETHALITY**

**FCV/AAN SYSTEMS NEED MULTIROLE TECHNOLOGY-  
DIRECT AND INDIRECT (NOT NECESSARILY ON ONE  
PLATFORM)**

**FORCE PROJECTION AND SUSTAINMENT DEMANDS  
MODULAR APPROACHES AND CREATIVE PACKAGING**

---